



**NOAA FISHERIES**  
NATIONAL MARINE FISHERIES SERVICE



# Authorizations and Permits for Protected Species (APPS)

File #: 16608

Title: San Joaquin River Restoration Program Interim

## Applicant Information

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Affiliation: Bureau of Reclamation

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## Project Information

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File Number: 16608

Application Status: Application Complete

Project Title: San Joaquin River Restoration Program Interim Flows Program, Steelhead Monitoring Plan

Project Status: New

Previous  
Federal or  
State Permit:

Permit Requested:  
• ESA Section 10(a)(1)(A) permit (Pacific fish)

Where will activities occur?: California (including offshore waters)

State department of fish and game/wildlife: N/A

**Research**

Timeframe:

Start: 01/27/2012 End: 03/31/2014

**Sampling**

Season/Project

Duration:

The sampling season for this activity would be for several seasons, including during the San Joaquin River Restoration Program (SJRRP) Interim Flows Project, during Water Year 2012 (WY 2012) and subsequent water years through March 31, 2014. Further, the monitoring of Central Valley steelhead would only occur between December 1 or approximately the time that California Department of Fish and Game's Hills Ferry Barrier is removed from the San Joaquin River near the confluence of the Merced River, to the time that Vernalis Adaptive Management Program (VAMP) flows or similar flows begin on the tributaries in the lower San Joaquin River, approximately mid- to late-March.

**Abstract:**

The implementation of Interim Flows includes implementation of the Steelhead Monitoring Plan (SMP) to check for Central Valley steelhead in the Restoration Area (located between the Merced River confluence and Friant Dam) during spring Interim Flows. Hills Ferry Barrier, located on the San Joaquin River near the confluence of the Merced River, is a weir designed to discourage fish migration to the upper reaches of the San Joaquin River. It is scheduled to be removed in mid-December. It is estimated that flows will occur as a result of VAMP or VAMP-like flows in the lower San Joaquin River tributaries from March 15th through April 30th. As a result, the critical timing for Central Valley steelhead monitoring within the Restoration Area would occur from mid-December through March 15th, as it is anticipated that steelhead would be attracted to tributary flows in the lower reaches. The Steelhead Monitoring Plan calls for the implementation of several options to monitor for steelhead that could make it past Hills Ferry Barrier. The SMP shall be utilized to detect the presence or absence of steelhead that may enter the Restoration Area. The impacts associated with the implementation of the SMP are anticipated to be minimal as historical data from the California Department of Fish and Game at the Hills Ferry Barrier for the monitoring of fish at the barrier have yet to record Central Valley steelhead at the facility.

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## Project Description

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Purpose:

Spring interim flows occurring from February 1 to June 1 could attract adult steelhead into the Restoration Area. Attracted steelhead would not have access to appropriate spawning habitat due to a number of impassable barriers. The Bureau of Reclamation (Reclamation) in coordination with the SJRRP multi-agency Fisheries Management Work Group (consisting of National Marine Fisheries Service, U.S. Fish and Wildlife Service, and DFG) has proposed the SMP to facilitate detection of steelhead on the San Joaquin River (SJR) upstream of the Merced River confluence and transport to suitable habitats downstream of the mouth of the Merced River.

Fall interim flows occurring from October 1 to December 1 could attract adult steelhead into the Restoration Area if the interim flows are higher than the flows in the SJR tributaries. However, during fall interim flows, the Hills Ferry Barrier (HFB) is in place just upstream of the confluence with the Merced River and ongoing fish monitoring occurs at HFB. Steelhead that reach the HFB could be detected and potentially trapped. In the fall of 2010, a trap was installed by the California Department of Fish and Game (CDFG) and operated by Reclamation, Denver Technical Service Center to assess the barrier's effectiveness. No steelhead were detected, however bar spacing on the trap could allow steelhead that are smaller and slimmer than salmon to escape.

Description: **BACKGROUND:**

In 1988, a coalition of environmental groups, led by the Natural Resources Defense Council (NRDC), filed a lawsuit challenging the renewal of long-term water service contracts between the United States and the Central Valley Project Friant Division Long-Term Contractors. After more than 18 years of litigation of this lawsuit, known as NRDC, et al. v Kirk Rodgers, et al., a Settlement was reached. On September 13, 2006, the Settling Parties, including NRDC, Friant Water Users Authority, and the U.S. Departments of the Interior and Commerce, agreed on the terms and conditions of the Settlement, which was subsequently approved by the U.S. Eastern District Court of California on October 23, 2006. The Settlement establishes two primary goals: (1) Restoration Goal – To restore and maintain fish populations in "good condition" in the mainstem San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish, and (2) Water Management Goal – To reduce or avoid adverse water supply impacts on all of the Friant Division long-term contractors that may result from the Interim and Restoration Flows provided for in the settlement.

## **Supplemental Information**

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Status of Species: ESA LISTING STATUS: Listed as threatened on Mar. 19, 1998; threatened status reaffirmed on Jan. 5, 2006. NOAA Fisheries issued results of a five-year review on Aug. 15, 2011, and concluded that this species should remain listed as threatened.\*

DESCRIPTION: The DPS includes all naturally spawned anadromous *O. mykiss* (steelhead) populations below natural and manmade impassable barriers in the Sacramento and San Joaquin Rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries, as well as two artificial propagation programs: the Coleman NFH, and Feather River Hatchery steelhead hatchery programs.\*

\*(NMFS, <http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Steelhead/STCCV.cfm>)

Methods:

### **Sampling Method 1: Raft Mounted Electroshocker**

Electrofishing is a common method used in monitoring steelhead population (e.g., Mill and Deer creeks, and Feather, American, Mokelumne, Stanislaus, and Merced rivers). One potential drawback for using electrofishing in rivers involves the difficulty in obtaining permits due to the possibility of injuring fish in anadromous salmonid waters. However, electrofishing effectiveness and safety have improved over time. Sampling frequency will be monthly from December through March of the following year. Capture of the same fish multiple times is to be anticipated, thus monthly sampling is important to ensure fish recovery from stress between capture. Raft mounted electroshockers will be used in order to navigate through shallow waters of the sampling locations (i.e., Mud Slough, Salt Slough, Newman Wasteway, Eastside Bypass, Mariposa Bypass, Sand Slough Control Structure, and base of Sack Dam). This is a three person task. One person to operate the boat and the main controller of the eshocker's generator. Then two netters. One of the two netters will have control of the pedal to turn the electricity on (push down) and off (release) for safety of the crew and the fish. Electrofishing methods would refer to the NMFS guidelines for sampling waters with anadromous fish (Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act. June 2000. <http://www.nwr.noaa.gov/ESA-Salmon-Regulations-Permits/4d-rules/upload/electro2000.pdf>). However, the guidelines are for backpack electrofishing, but researchers are not precluded from using other techniques or equipments as long as NMFS are given substantial proof that proposed techniques or equipments are necessary for the study and that listed species are safeguarded. Additional permitting is necessary under this method. This technique has a high potential to be successfully implemented during 2012 spring interim flows. The significant constraints to this method are permitting and access to appropriate sampling locations. The only difference between a boat-mounted electroshocker and a raft-mounted electroshocker is that a raft-mounted electroshocker can access shallow water habitats. We will use raft mounted electroshocker to have access to both deep and shallow water habitats. A boat electroshocker may be limited to only deeper water habitats. Backpack electroshocker will not be used due to the enormous size of the Restoration Area. Electroshocking raft can access the same habitat as a wading backpack electroshocker. Backpack electroshocker is limited by the wading individual. The same guidelines for initial and maximum settings for backpack electroshocking will be followed in raft-mounted electroshocking. We will only do one pass per month at each site due to the sensitivity of the species. Captured steelhead will be measured, pictured, catalogued, and translocated to a more suitable habitat (i.e., San Joaquin River at the Merced River Confluence).

### **Sampling Method 2: Fyke nets with wing walls and fish traps**

Migrating adult steelhead are difficult to monitor using techniques commonly used (e.g., carcass surveys, snorkel surveys, redd counts) to assess salmon populations due to their unique life-history traits. Steelhead, unlike salmon, may not die after spawning. Therefore, carcasses may not be available for a mark-recapture survey. In addition, steelhead migrate and spawn during the late-fall, winter, and spring months when rivers have periods of pulse flows (e.g., VAMP), high flows (e.g., flood releases), and turbid water conditions. A fyke net with wing walls and traps is the proposed sampling method to overcome difficulty of monitoring adult steelhead.

Fyke nets have long been used to capture migrating fish to monitor their yearly changes and abundances. This net tends to be the most useful in capturing fish that follow the shorelines at different times of the day during fish migration season. These nets are constructed of 3.7-cm mesh formed over a 1.5 m x 0.5 m rectangular lead hoop with 0.95 cm diameter solid round stock and three 1.5-m diameter hoops. The traps contain two 5 m long throats with 15 or 25 cm diameter throats, and have a zipper for easy fish removal. Wings will be 1.8 m deep and 48.8 m long. A buoy will be affixed with a 10-m length of rope. Nets will be held in place with 22-kg anchors and will be deployed in sampling locations (i.e., upstream of the confluence of the Merced River, the mouths of Mud, Slough, Salt Slough, Newman Wasteway, and existing structure at Sack Dam). This proposed technique will be implemented once the Hills Ferry Barrier is removed around mid-December and will remain deployed at the sampling locations until March 15. The traps will be checked daily so the likelihood of fish being physically injured is low. Adult steelhead that get captured will be sampled, tagged, and released. Data from this trap will give an actual count of steelhead abundance migrating in the upper reaches of the SJR.

Fyke nets will be used in lieu fyke traps for several reasons: fyke nets are relatively inexpensive and easy to install, are not a boat passage impediment (can be pushed down in the water column for boat passage), easily replaced if damaged, easy to transport, and no permitting required to transport. Although, California Department of Fish and Game wire fyke trap can catch fish in high flows, it will require a crane to remove the trap out of water under increased hydraulic pressure and in the event that the trap becomes silted.

#### Sampling Method 3: Steelhead specific trammel nets

Trammel nets are most common as stationary gear to block off channels with low velocities or no flows. However, they can also be used to drift in short durations (e.g., 20 min) on high velocity water. A short duration drifting of trammel net is necessary to prevent fish from being entangled for a long period of time. Trammel nets are advantageous and relatively efficient in turbid waters. This net consist of three parallel vertical layers of netting, the inner net has a very small mesh size, while the outer nets have mesh size large enough for fish to pass. The larger and smaller mesh size nets form a pocket when fish try to swim through. Similar to seine nets, trammel nets are equipped with floats attached to the head rope and lead weights along the ground rope. For safety reasons, brightly colored floats will be used to attach to the head rope so boaters and other recreationists can avoid entangling themselves, their boats, and/or their fishing gears with the nets while floated. To ensure safety of steelhead, fisheries biologists tending the nets follow at a close distance to observe, reduce risk of entanglement, and retrieve nets in short time intervals. Sampling time will depend on the number of fish and bycatch caught at each location.

Sampling will begin during adult steelhead migration (mid-December until mid-March) on a number of habitats on the SJR where steelhead may be present. Additional permitting is necessary under this method.

#### Fish Handling and Relocation

For all sampling methods listed above, captured adult CV steelhead will be subject to standard handling and transporting procedures. Captured steelhead will be recorded, measured (i.e., fork length and total length), sexed (if possible), sampled for scales and tissues, and checked for injuries and presence of tags. Additionally, fish will be Floy tagged with a unique identification number to document any recaptures that may occur in the study area.

Captured steelhead would be transported downstream of the mouth of the Merced River in transport tanks following proposed transport protocols. The transport tanks will be immediately filled with river water prior to transport using a portable screened water pump. Captured steelhead will be moved in and out of the transport truck using a water-filled vessel to help minimize stress and loss of slime. Oxygen gas will be supplied to the transport tanks using compress oxygen gas cylinders and micro-bubble diffusers to maintain dissolved oxygen levels at near saturation during transport. Transport water will be supplemented with sodium chloride to decrease ionic gradient as another way to minimize stress. The truck will be stopped after 30 minutes of transportation and each hour thereafter for visual inspection of the life-support system and fish wellbeing. Water will be tempered to the receiving water at the predetermined release location before transferring fish, by pumping receiving water directly into the transport tank until the temperature reaches that of the release water.

Lethal Take:	Hills Ferry Barrier (HFB) has been operated every fall by DFG on the SJR since 1992. CV steelhead have not yet been captured or identified. However, the HFB has not been operated in the spring when steelhead are emigrating from the downstream tributaries. The opportunity for these fish to access the SJR upstream of the Merced River has been extremely low due to inhospitable water flow and water quality conditions. Although Interim Flows may provide conditions that could allow steelhead to stray upstream of the Merced River, the likelihood of finding CV steelhead in the SJR upstream of the Merced River is low and lethal take is not anticipated for this study.
Anticipated Effects on Animals:	Effects associated with monitoring from utilization of the raft mounted electroshocker may occur and result in potentially non-lethal effects. Staff involved in implementation of the SMP will use caution in electroshocking techniques. The sampling frequency will be monthly in order to reduce the likelihood of capturing the same fish multiple times and to allow ample recovery time. The potential lethal take is described in "Lethal Take", above. Electroshocking also has a potential to harm or harass CV steelhead, if present, through capture and study activities. However, these effects are temporary.
	Effects associated with the capture of fish with fyke nets and fish traps are anticipated to be non-lethal. The traps will be checked daily to reduce the risk of fish sustaining physical injury. Any CV steelhead that are captured will be sampled, tagged, and released. The trapping, sampling, and tagging of fish could result in a small amount of harm or harassment. However, the effects are expected to be temporary, minimal, and non-lethal.
	Effects associated with the placement and use of trammel nets would be similar to the effects to CV steelhead from the use of fyke nets. The nets would be drifted and fisheries biologists would be present on-site during their placement to ensure that species collected would be expeditiously sampled and released. The effects from the use of trammel nets is expected to be temporary, minimal, and non-lethal.
Measures to Minimize Effects to Listed Species:	There could be potential effects to steelhead in fish handling and relocation. Care will be taken to ensure that stress to the fish is minimized. Fish transport tanks with water pumps, gas cylinders, diffusers, and sodium chloride will be used to minimize stress. However, some effects could occur as CV steelhead could be harmed or harassed through this process.
	The use of fyke nets and trammel nets will be implemented and monitored frequently. The fyke nets will be checked at least daily and the trammel nets will be manned during the entire time of their deployment. As biologists will be present during these activities, this is expected to minimize negative effects as staff would be present to collect and release fish in a reasonable period of time.
	Raft mounted electroshockers will be utilized in coordination with suggested NMFS guidelines for electroshocking and in coordination with NMFS staff before and during monitoring activities. All staff will be trained in the use of electroshocking and the sampling frequency will be limited to once per month in specific locations to avoid stress to the species and allow for adequate recovery time as it is expected that the same fish could be captured multiple times.
	The transportation and handling of fish will occur quickly and any CV steelhead caught will be transported downstream of the Merced River confluence with the SJR. Captured steelhead would be transported downstream of the mouth of the Merced River in transport tanks following proposed transport protocols. The transport tanks will be immediately filled with river water prior to transport using a portable screened water pump. Captured steelhead will be moved in and out of the transport truck using a water-filled vessel to help minimize stress and loss of slime. Oxygen gas will be supplied to the transport tanks using compress oxygen gas cylinders and micro-bubble diffusers to maintain dissolved oxygen levels at near saturation during transport. Transport water will be supplemented with sodium chloride to decrease ionic gradient as another way to minimize stress. The truck will be stopped after 30 minutes of transportation and each hour thereafter for visual inspection of the life-support system and fish wellbeing. Water will be tempered to the receiving water at the predetermined release location before transferring fish, by pumping receiving water directly into the transport tank until the temperature reaches that of the release water.
Resources Needed to Accomplish Objectives:	The staff that will be involved in these monitoring activities will be trained staff with specialized skills in collection and sampling techniques. Fisheries biologists, out of Reclamation's Technical Services Center, DFG, and U.S. Fish and Wildlife Service, implementing the monitoring activities are trained and have experience in the use of nets, traps, and electroshockers.
	Reclamation shall purchase and supply all required equipment, including vehicles, nets, gloves, traps, the raft electroshocker, and any other required equipment.

Disposition of Tissues:	Samples will be surrendered to the California Department of Fish and Game at the conclusion of sampling for testing and disposition.
Public Availability of Product/Publications:	An annual project report for Steelhead Monitoring will be submitted to the Bureau of Reclamation SJRRP and the SJRRP Fisheries Management Work Group by June 1 of each year. Once reviewed and finalized, this report will be provided to the public via the SJRRP web site at: <a href="http://www.restoresjr.net">www.restoresjr.net</a> .

## Federal Information

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Federal Agency	Type	Authorization Number and Title	Date Signed	Expiration Date	Listing Units/Stocks Covered	Comments
U.S. Bureau of Reclamation (BOR)	Funding	San Joaquin River Restoration Program, Water Year			Steelhead, California Central Valley (NMFS Threatened)	The funding will be provided through the San Joaquin River Restoration Program and shall be provided via a Work Request and Advanced Funding Agreement with Reclamation's Technical Services Center.
U.S. Army Corps of Engineers (Corps)	Section 10 permit	Section 10 Permit, Rivers and Harbors Act Authorization		N/A		A Section 10 permit from the U.S. Army Corps of Engineers may be required for the placement of trammel nets within a navigable water of the United States.
National Marine Fisheries Service (NMFS)	Section 7 Consultation (Biological Opinion)	Section 7 Authorization for Central Valley Steelhead			Steelhead, California Central Valley (NMFS Threatened)	A Section 7 consultation will be required for the take of Central Valley Steelhead, which are listed as threatened under the Endangered Species Act.

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## Location/Take Information

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### Location

Research Area: Pacific Ocean State: CA Sub Basin (4th Field HUC): Middle San Joaquin-Lower Stream Name: San Joaquin River Begin Mile: 182.0 End Mile: 118.0  
 Location Description: The Steelhead Monitoring Plan will occur along locations on the San Joaquin River between the base of Sack Dam and the confluence of the Merced River.

### Take Information

Line Ver	Species	Listing Unit/Stock	Production /Origin	Life Stage	Sex	Expected Take	Indirect Mort	Take Action	Observe /Collect Method	Procedure	Run	Transport Record	Begin Date	End Date

1	Steelhead	California Central Valley (NMFS Threatened)	Natural	Unknown	Male and Female	6	0	Capture/Mark, Tag, Sample Tissue/Release Live Animal	Net, Fyke	Finclip - mark; Tag, Floy; Tissue Sample Scale	Mixed N/A	1/27/2012	3/31/2012
2	Steelhead	California Central Valley (NMFS Threatened)	Natural	Unknown	Male and Female	10	1	Capture/Mark, Tag, Sample Tissue/Release Live Animal	Electrofishing, Boat	Finclip - mark; Tag, Floy; Tissue Sample Scale	Mixed N/A	1/27/2012	3/31/2014
3	Steelhead	California Central Valley (NMFS Threatened)	Natural	Unknown	Male and Female	2	0	Capture/Mark, Tag, Sample Tissue/Release Live Animal	Net, Trammel	Finclip - mark; Tag, Floy; Tissue Sample Scale	Mixed N/A	1/27/2012	3/31/2014

## NEPA Checklist

1) If your activities will involve equipment (e.g., scientific instruments) or techniques that are new, untested, or otherwise have unknown or uncertain impacts on the biological or physical environment, please discuss the degree to which they are likely to be adopted by others for similar activities or applied more broadly.

The techniques utilized in the sampling methods for CV steelhead are customary.

2) If your activities involve collecting, handling, or transporting potentially infectious agents or pathogens (e.g., biological specimens such as live animals or blood), or using or transporting hazardous substances (e.g., toxic chemicals), provide a description of the protocols you will use to ensure public health and human safety are not adversely affected, such as by spread of zoonotic diseases or contamination of food or water supplies.

While this proposal includes transporting captured CV steelhead, the fish will be released back to the San Joaquin River from which they came. There are no toxic chemicals proposed in association with this monitoring effort.

3) Describe the physical characteristics of your project location, including whether you will be working in or near unique geographic areas such as state or National Marine Sanctuaries, Marine Protected Areas, Parks or Wilderness Areas, Wildlife Refuges, Wild and Scenic Rivers, designated Critical Habitat for endangered or threatened species, Essential Fish Habitat, etc. Discuss how your activities could impact the physical environment, such as by direct alteration of substrate during use of bottom trawls, setting nets, anchoring vessels or buoys, erecting blinds or other structures, or ingress and egress of researchers, and measures you will take to minimize these impacts.

We will be working on capturing fish from sloughs and canals where habitat is unsuitable for the fish and relocate them to acceptable and suitable habitats within the Restoration Area.

4) Briefly describe important scientific, cultural, or historic resources (e.g., archeological resources, animals used for subsistence, sites listed in or eligible for listing in the National Register of Historic Places) in your project area and discuss measures you will take to ensure your work does not cause loss or destruction of such resources. If your activity will target marine mammals in Alaska or Washington, discuss measures you will take to ensure your project does not adversely affect the availability (e.g., distribution, abundance) or suitability (e.g., food safety) of these animals for subsistence uses.

The project will be implemented in a way to avoid adverse impacts to cultural and historic resources, consistent with Section 106 of the National Historic Preservation Act. No activities planned here are proposed to modify the physical or aesthetic characteristics of any eligible properties.

5) Discuss whether your project involves activities known or suspected of introducing or spreading invasive species, intentionally or not, (e.g., transporting animals or tissues, discharging ballast water, use of equipment at multiple sites). Describe measures you would take to prevent the possible introduction or spread of non-indigenous or invasive species, including plants, animals, microbes, or other biological agents.

While this proposal includes transporting captured CV steelhead, the fish will be released back to the San Joaquin River from which they came. There are no known or suspected results that could occur from the monitoring activities that could result in the intentional or unintentional spread of disease or invasive species in the restoration area.

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## Project Contacts

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Responsible Party: Michelle Banonis  
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Primary Contact: Michelle Banonis

Principal Investigator: Don Portz

Other Personnel:

Name	Role(s)
Eric Best	Co-Investigator
Matt Bigelow	Co-Investigator
Eric Guzman	Co-Investigator
Norm Francisco Ponferrada	Co-Investigator
Michelle Workman	Co-Investigator

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## Attachments

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Certification of Identity - P16608T1116608\_BOR\_11-16-2011.pdf (Added Nov 17, 2011)

Contact - Don Portz: C14501T5Portz Fish Resume.doc (Added Nov 2, 2010)

Contact - Eric Best: C14502T5Best\_Fish CV 2010.doc (Added Sep 15, 2010)

Contact - Eric Guzman: C14503T5Fish Handling Résumé\_eg.doc (Added Sep 15, 2010)

Contact - Matt Bigelow: C14504T5Fish Handling Résumé\_mb.doc (Added Sep 15, 2010)

Contact - Michelle Workman: C14672T5MichelleWorkman\_bio.doc (Added Oct 15, 2010)

Contact - Michelle Workman: C14672T5short resume workman 2011.doc (Added Oct 31, 2011)

Contact - Norm Francisco Ponferrada: C15680T5Norm Ponferrada Resume2011 \_DOI\_.pdf (Added Nov 10, 2011)

Project Description - P16608T1mp170\_FINAL\_wy2012interimflows\_SMP.pdf (Added Oct 28, 2011)

Project Description - P16608T1P16608T1Permit.pdf (Added Jan 10, 2012)

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## Status

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Application Status: Application Complete

Date Submitted: November 17, 2011

Date Completed: December 13, 2011

FR Notice of Receipt Published: December 13, 2011 Number: 2011-31956

Comment Period Closed: January 12, 2012 Comments Received: No Comments Addressed: No

Last Date Archived: January 30, 2012

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• ESA Section 10(a)(1)(A) permit (Pacific fish)

Current Status: Issued Status Date: January 27, 2012

Section 7 Consultation: Formal Consultation

NEPA Analysis: Categorical Exclusion

Expire Date: March 31, 2014

Analyst Information:

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## Modification Requests

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## Reports

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